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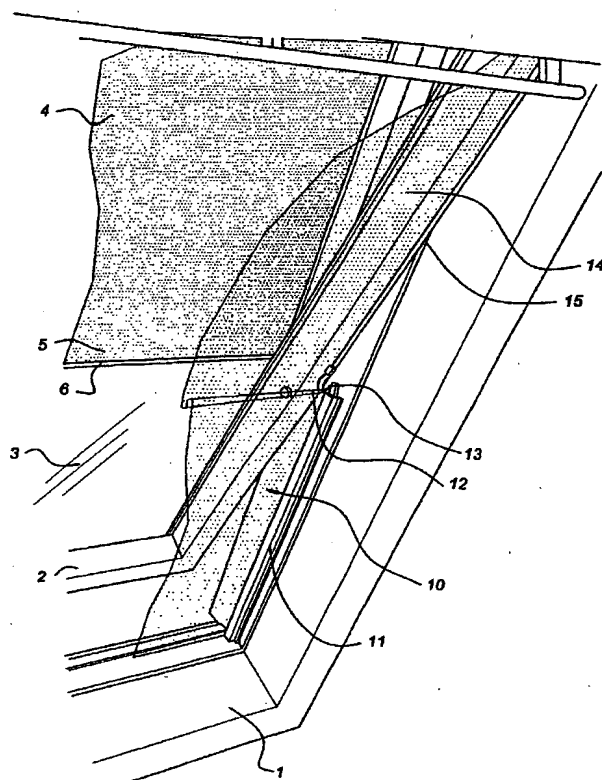
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[Continued on next page]

(54) Title: SCREEN ASSEMBLY



(57) Abstract: Screen assembly for a tiltable window. The assembly comprises two parts. On the outside, a part which extends from the top side of the frame to approximately the tilting point of the window is arranged on the said frame. The end part of this screen part is of flexible design and is provided with a weight and rests on the glass surface of the window. The underside is sealed by a substantially rectangular screen part which is accommodated on the inside in the frame. Sealing with respect to the window is effected either by extending the rectangular screen part which comprises a flexible part or by a separate flexible part which comes into sealed engagement with the rectangular part which is positioned on the inside of the frame.

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Screen assembly

The present invention relates to a screen assembly for a window opening of a pivot window which is equipped with a frame and a window which is arranged therein in such a manner that it can tilt about a substantially central tilting point, which screen assembly is provided with a first screen part, which comprises a substantially flat part which can be positioned against the frame of the pivot window on a first side thereof in order to close off a first part of the window opening and is provided with first abutting means for abutting against the window, and a second screen part, which is provided to close off a second part of the window opening, the second screen part comprising a substantially flat part which is provided to be arranged against the frame on a second, opposite side of the pivot window and is provided with second abutting means in order to be connected to the window on an opposite side of the said window, at least one out of the first and second abutting means being of movable design in order to be abutted to a window pane which forms part of the window.

A screen assembly of this type is known from US-A-1,701,701.

There are at least two problems with using a screen in a tilting window. Firstly, two screen parts or a special design have to be present, since on one side a part of the tilting or pivot window moves outwards and on the other side a part of the tilting or pivot window moves inwards.

A second problem is presented by the fact that the tilting movement does not take place about a stationary horizontal axis. This means that the turning point shifts during turning. This makes sealing of the screen parts more difficult.

According to US 1,701,701, it is proposed to produce a seal by securely connecting the second screen part to the frame with the aid of an end profile, in the vicinity of the tilting point of the window. A hook-shaped flap is arranged in this fixed end profile, the other side of which flap is supported on the pane of the window. This flap moves with the window and provides a seal as a function of the position of the window.

In the closed position of the window, the flap extends vertically, i.e. the view is considerably impeded by the presence of the flap.

A structure of this type has the drawback that, first of all, it is particularly complicated to realize. In particular, it is altogether inappropriate for retrofitting to

existing window structures. A second drawback is that a considerable part of the incident light is blocked. The object of the invention is to avoid these drawbacks.

This object is achieved, in the screen assembly described above, in that the first and second abutting means each have a flexible part which can be adapted to any position of the open window in the vicinity of the tilting point thereof and is designed to bear against the window in a sealed manner, in the vicinity of the tilting point, in any opening position.

According to the present application, the weighted end part is directly connected to the screen/screening mesh and is arranged so that it can move freely, i.e. a complicated, unattractive structure with a fixed channel extending across the window as proposed in US patent 1,701,701 is no longer required. Sealing is achieved in a simple manner by designing the end part of the screen part, which is situated on the outer side and can otherwise be attached to the frame, so as to hang freely and by providing a weight, such as a tube. This weight rests on the window as it moves outwards. This freely hanging part may be of relatively short design (a few centimetres), so that there is no risk of flapping and the like. Tests have shown that phenomena of this nature do not occur.

Preferably, the weight, which is designed as a tube or slat, has its ends accommodated in holding means arranged on either side of the tiltable window, while the flexible end part of the second screen part extends beyond the pivot point of the frame.

In the structure according to the present invention, it is necessary for the screen part which is on the inside to be sealed in some way with respect to the tiltable window. According to the invention, this can be achieved in various ways.

According to a first option, the rectangular screen part which is attached to the frame on the inside of the window is provided with an extension of the screening mesh material. This extension may be attached to the window. On account of the flexible nature of the screening mesh material, this extension can adapt itself to the position of the window with respect to the fixed screen part which is attached to the inside of the frame. If appropriate, this extension may be provided with an auxiliary part which extends over the entire upper window surface of the tiltable window. It is also possible for this flexible extension to be of relatively short design and to act in a directly sealed manner on the window with the aid of some form of structure.

Naturally, measures are taken to prevent insects and the like from being able to enter along the side of the extension. For this purpose, a strip of flexible material or the like can be provided.

5 According to another alternative, a separate flexible part is present on the tiltable window, which acts in a sealing manner on the screen part which is arranged on the inside of the frame. In this case, during the tilting movement this flexible part slides along the screen part arranged on the inside. A sliding movement of this nature can be guided, for example, by fitting a rod or other guide which is securely attached to the frame and along which the flexible part slides. As above, this flexible part may be
10 arranged so that it is directly sealed on the glass in the window, but may also be provided with an extension, so that the top part of the window is covered with screening mesh.

It should be understood that the above designations bottom - top, outside - inside relate to a preferred position, and that it is possible to change these positions
15 depending on use. These indications of position are included in this description purely in order to provide a better understanding of the present invention.

With the present invention, it is possible without further special measures to tilt the tilting window outwards through a considerable angle without there being any risk of insects entering. The window can be tilted at least 30° with respect to the frame.
20 Moreover, it is possible to use the screen assembly according to the invention in combination with existing blinds or blinds which are yet to be fitted and may be displaceably arranged. As a result of the screen assembly according to the invention being designed in split form, it is possible in a simple manner to remove the screen part situated on the inside, for example for airing bedding and the like.

25 The invention will be explained in more detail below with reference to exemplary embodiments illustrated in the drawing, in which:

Fig. 1 shows a diagrammatic and perspective view of a first embodiment of the invention from the inside;

Fig. 2 shows the embodiment shown in Fig. 1 from the outside;

30 Fig. 3 shows a side view of the embodiment shown in Fig. 1;

Fig. 4 shows an enlarged detail of Fig. 3 in the tilted position;

Fig. 5 shows the detail in accordance with Fig. 4 in a (nearly) closed position;

Fig. 6 shows a view corresponding to that shown in Fig. 1 of a second embodiment of the screen assembly according to the invention;

Fig. 7 shows a side view of the embodiment shown in Fig. 6;

Fig. 8 shows a perspective view, from the outside, of a third variant
5 embodiment of a screen assembly according to the invention;

Fig. 9 shows a perspective view, from the inside, of the embodiment shown
in Fig. 8;

Fig. 10 shows a partial view of a longitudinal section of the embodiment
shown in Figs 8 and 9, with the pivot window in a partially open position;

10 Fig. 11 shows a partial view, corresponding to that shown in Fig. 10, with
the pivot window in a further-open position;

Fig. 12 shows a perspective detailed view of an optional design detail of the
embodiment shown in Figs 8 and 9.

In Figs 1-5, a window frame is denoted by 1. In the embodiment shown
15 here, this frame is arranged in a sloping roof, but it should be understood that it may
also be arranged vertically. A tiltable window 2 is situated inside frame 1. The tilting
movement does not take place precisely along a stationary horizontal axis, but rather
shifts slightly. Window 2 is provided with a window pane 3. The screen assembly
according to the present invention comprises two parts, namely an outer screen part 4
20 and an inner screen part 10. Details of the outer screen part 4 can be seen in Fig. 2.
Fig. 2 shows that the outer screen part 4 is attached to the frame 1 along three sides of
the said frame with the aid of an attachment strip 7. The fourth, bottom side of the outer
screen part 4 comprises a loose end part 5 which is a few centimetres long and is
provided, in the vicinity of the end, with a weight arranged therein, such as a tube 6.
25 The width of this end part 5 is narrowed at the location of tube 6, in such a manner that
tube 6 comes to rest on window pane 3 when the window 2 is tilted outwards.

The inner screen part 10 comprises a substantially rectangular part which,
with the aid of an attachment strip 11, is likewise attached to three sides of the frame 1,
but in this case on the inside. At the top, that is to say the fourth side, the screening
30 mesh is extended by a flexible part 12 which is then connected to an auxiliary part 14.
This auxiliary part 14 is of slightly narrower design and can be attached to three sides
of the window 2 with the aid of attachment strip 15. The flexible part 12 is laterally
delimited by an edge strip 13. The length of the flexible part 12 is such and this part is

designed in such a manner that this flexible part can follow the movement during the pivoting of the window 2, which is not purely rotational, without becoming stretched. Details of the transition between the bottom part of the inner screen part 10 and the auxiliary part 14 can be seen in Figures 3-5. The attachment strip 11 is designed here in such a manner that inner screen part 10 can easily be folded away upwards so that a free opening to the outside is formed.

Figs 6 and 7 show a second embodiment of the screen assembly according to the invention. The frame shown in those figures is denoted by 21, and this frame is provided with a window 22 with window pane 23. The outer screen part has not significantly changed compared to the design shown in the previous figures and is denoted by 24. It is provided with a loose end part 25 in which a tube 26 is accommodated.

On the inside, however, there are considerable changes with respect to the embodiment shown in the above figures. The inner screen part is denoted by 30, and the attachment strip on the frame is indicated by 31. Unlike the above embodiments, the inner screen part is delimited at the top by an upper strip 32 (which has been partially omitted for the sake of clarity in Fig. 6). The result is a rectangular frame structure with screening mesh arranged therein. This rectangular frame structure is easy to remove so that, for example, bedding or the like can easily be aired. To provide a seal with the window 2, there is a flexible part 34 which, in this embodiment, is attached to the window 22. Part 34 is provided with an extension 35 which provides a seal at the top of the window. Extension 35 is attached to window 22 on three sides by attachment 36. As can be seen from Figs 6 and 7, the flexible part 34 is curved outwards slightly with respect to the window 22. This space is required in order to accommodate a stationary rod 33 which is clamped between the sides of the frame 21. During the tilting movement, the flexible part 34 slides along this rod 33. On the other side, this rod 33 is arranged at a short distance from top strip 32, i.e. flexible part 34 slides to and fro between rod 33 and top strip 32 when the tilting movement is taking place. As a result, it is always possible to ensure an optimum seal between the various components.

Obviously, it is also possible for the flexible part 34 to be directly connected to the window 23, making the extension 35 superfluous.

Figs 8-12 show a third embodiment of an insect screen according to the invention for a pivot window which can pivot about a central axis. This embodiment is likewise provided with a screen assembly which comprises two parts and, by means of flexible pieces of the screen material, bears in a sealed manner against the opposite sides of the pivot window in the vicinity of the central pivot axis thereof. As a result, the insect screen can adapt itself to any opening position of the pivot window.

Fig. 8 shows a perspective view of the outside of a centrally pivoting pivot window in an open position.

Fig. 9 shows a perspective view of the inside of the pivot window from Fig. 8.

The screen assembly shown in Figs 8 and 9 is positioned in a frame 41 which is provided with a rotatable window 42 which is arranged in the frame 41 in such a manner that it can pivot about a substantially horizontal central axis. The screen assembly is provided with an outer part 44 which closes off a top part of the frame 41 and is abutted against the outside of the frame 41, and an inner part 50 which is abutted against the bottom section of the frame 41 and furthermore, by means of a top part 55, is connected to the inside of the inwardly pivoted top edge of the pivot window 42. A flexible end part 45 of the outer part 44 preferably extends downwards to beyond the pivot axis of the pivot window 42 and has a weighting tube or slat 46, by means of which it bears against an outer side of the pivot window or against the window pane 43 situated therein, in the vicinity of its pivot axis.

As will further become clear from Figs 9-12, the inner part 50 of the screen assembly in this third embodiment is slightly different from the embodiments described above.

The inner part 50 can be rolled up in a housing 61 which, as can be seen in Figs 9-11, is arranged on a window sill of the frame 41. The screen material may, as is customary with roll-up insect screens, be unwound under spring force from a rotatable roll inside the housing 61. The free end of the roll-up screen material is provided with an attachment strip 56 which may be releasably attached to the top edge of the inwardly pivoted pivot window 42. To ensure that the inner part 50 bears correctly, there is a guide rod 53 arranged at the level of the pivot axis. At the ends of this guide rod 53 there are spring-loaded pressure-exerting arms 63 which are arranged in the vicinity of the inside of the frame and press the respective side edges of the screen material of the

inner part 50 against the pivot window. Moreover, the guide rod 53 is arranged in the vicinity of the pivot axis of the pivot window 42, in such a manner that the centre part of the flexible screen material can only sag to a limited extent. This prevents the edges of the screen material from slipping out beneath the pressure-exerting arms 63. Figs 10 and 11 show how the spring-loaded pressure-exerting arms 63 can adapt themselves to the various positions of the open pivot window 42. Since relative movement can take place between the pressure-exerting arms 63 and the screen material during the pivoting of the pivot window 42, the pressure-exerting arms 63 are each preferably provided with a roller 65. In this way, it is possible to ensure that the top half of the inner screen part 50 bears tightly against the inwardly pivoted edge of the pivot window 42, so as to exclude insects. To ensure that the bottom half of the inner part 50 can also be suitably connected to the mutually opposite sides of the frame 41, it may be necessary for fixed side guides or brush profiles to be arranged from the housing 61 to the pivot axis of the pivot window. These side guides or brush profiles are not shown in Figures 8-12, but features of this type are known to the person skilled in the art. Under certain circumstances, for example if window fasteners or latches are situated on the window sill of the frame 41, it may be necessary to switch the position of the housing 61 with that of the attachment strip 56.

Furthermore, it may be advantageous for the guide rod 53 with the pressure-exerting arms 63, as shown in Fig. 12, to be of removable design. In the detailed embodiment shown in Fig. 12, a torsion spring is integrated in the attachment of the pressure-exerting arm 63 to the guide rod 53. An attachment clip 66, which is provided with a slot 67, is screwed securely onto each of the inwardly facing sides of frame 41. The guide rod 53 is in this case provided at its ends with an end 68 which interacts with this slot and can be accommodated in the slot 67 in the attachment clip 66 in a non-rotatable but releasable manner in the direction of the arrow 69. In the embodiment shown in Figs 8-12, the outer part 44 in turn provides the seal for the open top half of the frame 41. In this case, this outer part is preferably likewise arranged removably by means of an attachment strip 47. For this purpose, the person skilled in the art knows that it is possible to use hook-and-loop fasteners, magnetic strips or sections with a push-in cord.

In the above text, the attachment of the screening mesh or other cloth which is used has been described with reference to attachment strips. It will be understood that

any other design which is known in the prior art can also be used. For example, it is possible to obtain a structure which is particularly easy to remove by permanently attaching a base to the window or frame and attaching the screening mesh thereto with the aid of an edge made from hook-and-loop fastening, magnetic strip or the like. Other designs are also possible. In this way, it is easily possible to remove parts of the screen assembly as required.

Variants of this type, as well as further embodiments of the screen assembly, are obvious to the person skilled in the art on reading the above description and lie within the scope of the appended claims.

10 Compared with known solutions for attaching insect screens to pivot windows, which have always been somewhat elaborate and complex, the invention provides a solution which is inherently more practical and attractive.

CLAIMS

1. Screen assembly for a window opening of a pivot window which is equipped with a frame (1, 21, 41) and a window (2, 22, 42) which is arranged therein in such a manner that it can tilt about a substantially central tilting point, which screen assembly is provided with a first screen part (10, 30, 50), which comprises a substantially flat part which can be positioned against the frame (1, 21, 41) of the pivot window on a first side thereof in order to close off a first part of the window opening and is provided with first abutting means (12, 34, 55) for abutting against the window (2, 22, 42), and a second screen part (4, 24, 44), which is designed to close off a second part of the window opening, the second screen part comprising a substantially flat part which is provided to be arranged against the frame (1, 21, 41) on a second, opposite side of the pivot window and is provided with second abutting means (5, 6; 25, 26; 45, 46) in order to be abutted against the window (2, 22, 42) on an opposite side of the said window, at least one out of the first and second abutting means (12, 34; 5, 6, 25, 26; 45, 46) being movable in order to be abutted against a window pane (3, 23, 43) which forms part of the window (2, 22, 42), characterized in that the first and second abutting means (12, 34; 5, 6, 25, 26, 55) each have a flexible part (5, 25; 12, 34) which can be adapted to any position of the open window in the vicinity of the tilting point thereof and is designed to bear against the window (2, 22, 42) in a sealed manner, in the vicinity of the tilting point, in any opening position.
2. Screen assembly according to Claim 1, in which the flexible part (5, 25, 45) of the second abutting means is provided with a weight (6, 26, 46) which is designed to ensure that the second abutting means rest in a sealed manner on the window pane (3, 23, 43).
3. Screen assembly according to Claim 2, in which the weight (6, 26) is designed as a tube which is accommodated in holding means (7) arranged on either side of the tiltable window (2, 22).
4. Screen assembly according to Claim 1, 2 or 3, in which the first abutting means have an auxiliary part (14, 55) which forms part of the substantially flat part of the first screen part (10), which auxiliary part is designed to be attached to the tiltable window (2).

5. Screen assembly according to Claim 4, in which the auxiliary part (14), by means of the flexible part (12, 42), directly adjoins the substantially flat part of the first screen part (10).
6. Screen assembly according to Claim 1, 2 or 3, in which the first abutting means have a flexible seal (34) which is to be arranged on the tiltable window (22) in the vicinity of its tilting point and is designed to act between the window and the substantially flat part of the first screen part (30, 50).
7. Screen assembly according to Claim 6, provided with a guide rod (33) which is to be secured in the frame in the vicinity of the tilting point of the window, for guiding the flexible seal (34), which flexible seal can be attached to the tiltable window in the vicinity of the guide rod (33) at points which lie on either side of the guide rod, at a distance from one another.
8. Screen assembly according to Claim 6 or 7, in which the flexible seal (34) is provided with an extension (35) which can be attached to the tiltable window (22).
9. Pivot window provided with a frame in which there is arranged a window which can tilt about a central tilting point and which is equipped with a screen assembly according to one of the preceding claims.
10. Pivot window and screen assembly according to Claim 9, in which the abutting means (5, 6; 25, 26; 45, 46) of at least the second screen part (4, 24, 44) extends beyond the tilting point.

Fig 1

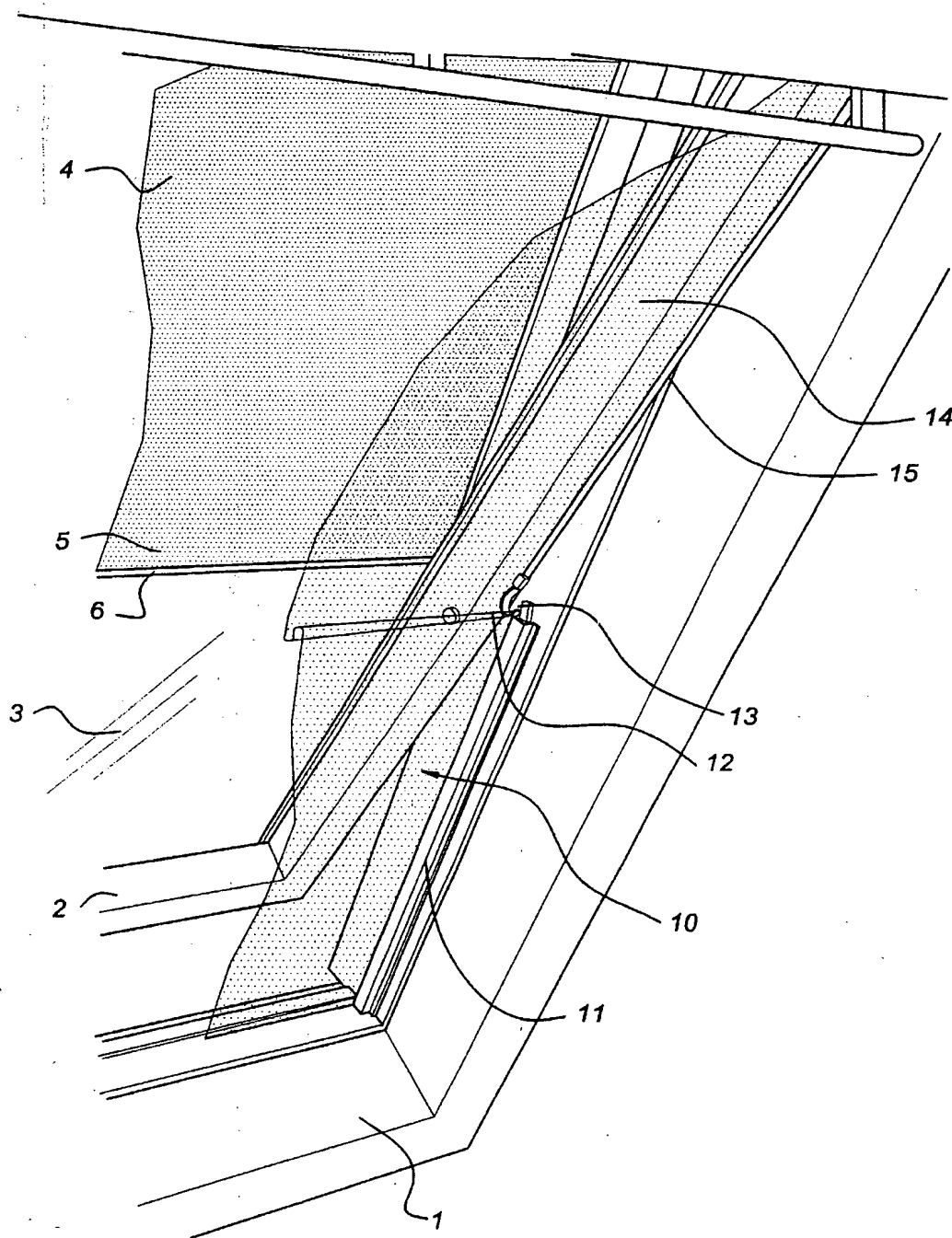
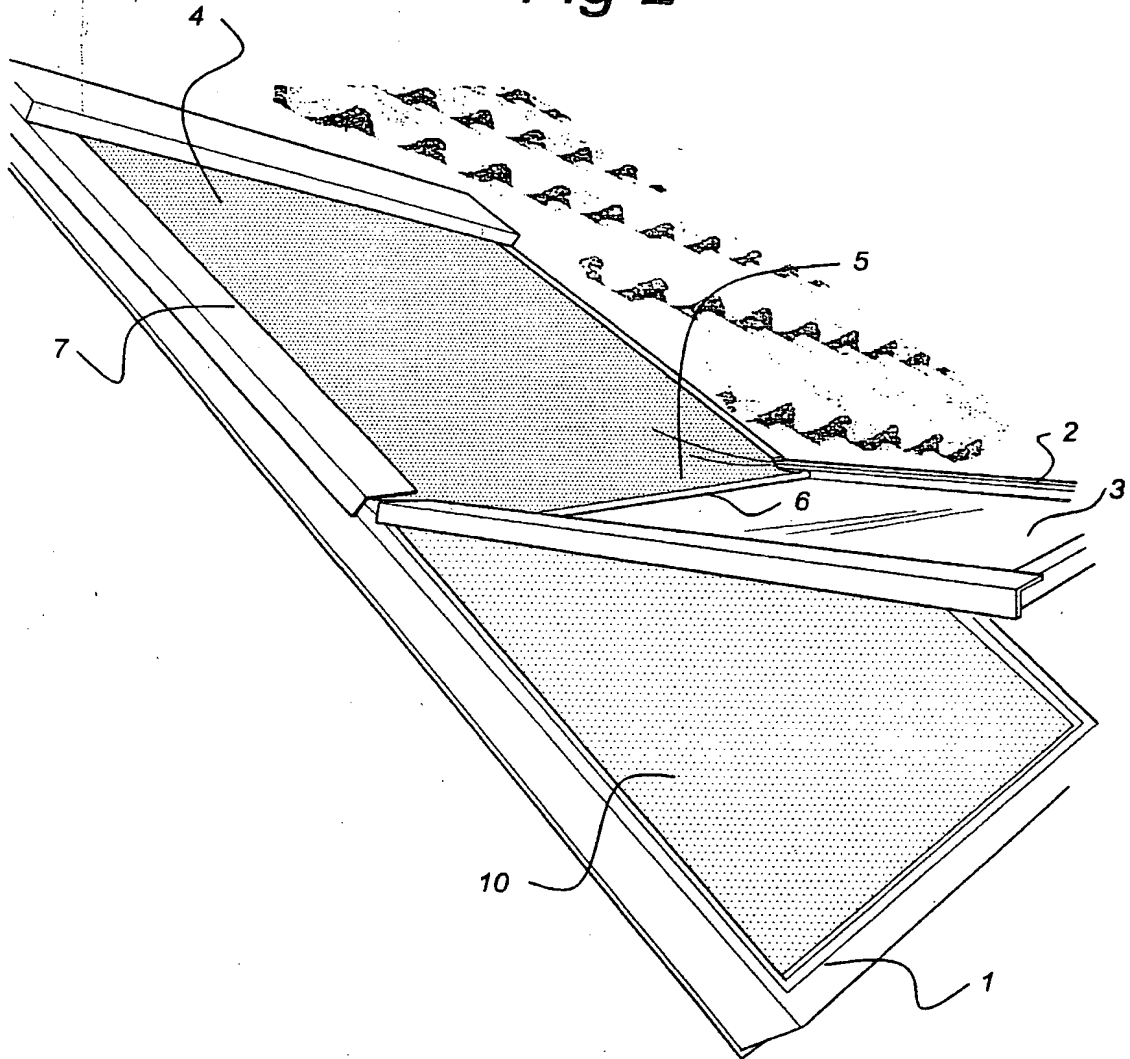


Fig 2



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Fig 3

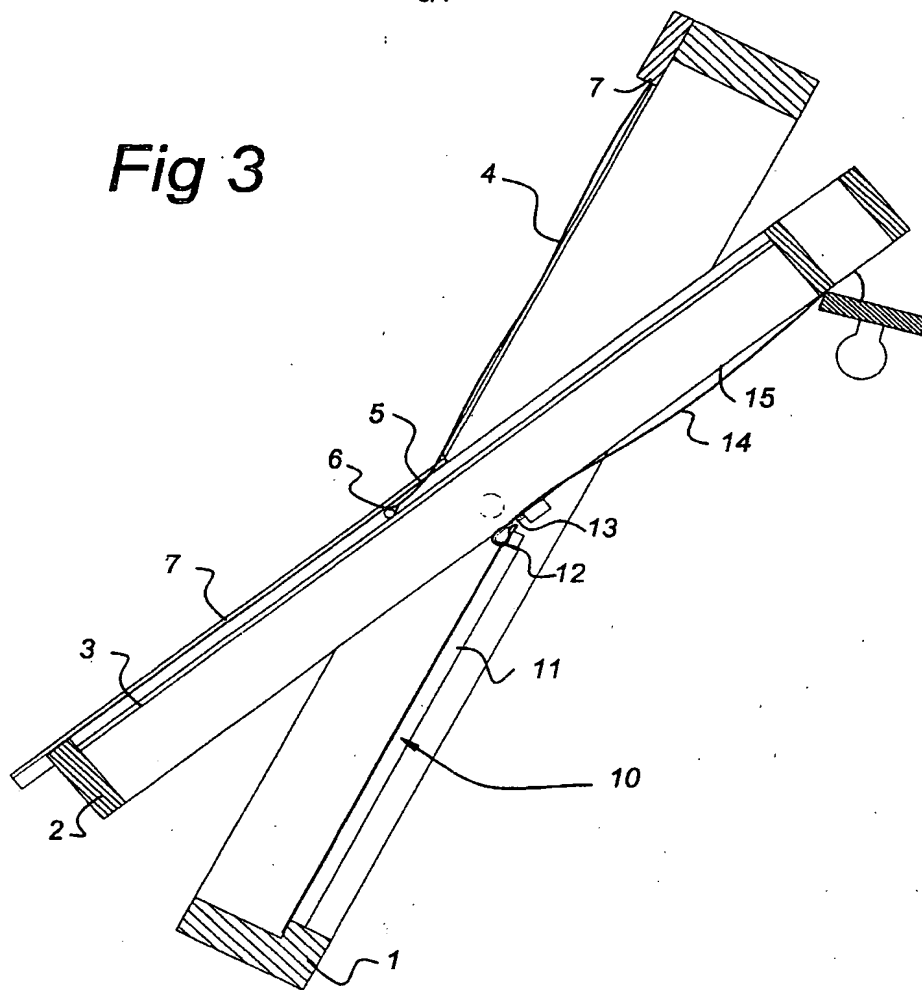


Fig 4

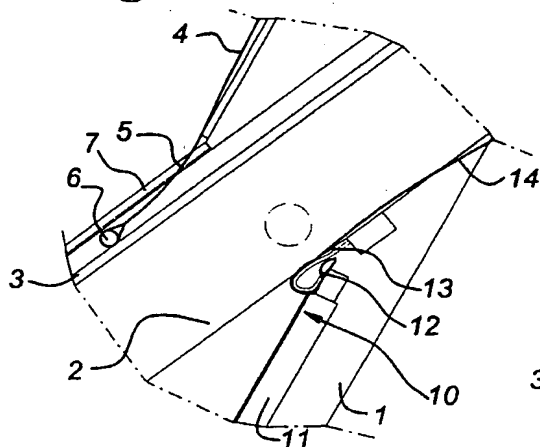


Fig 5

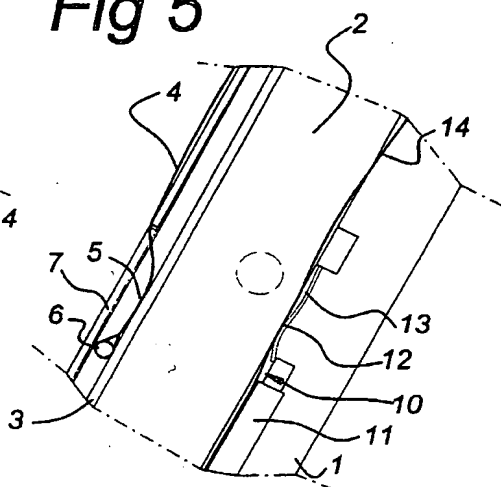


Fig 6

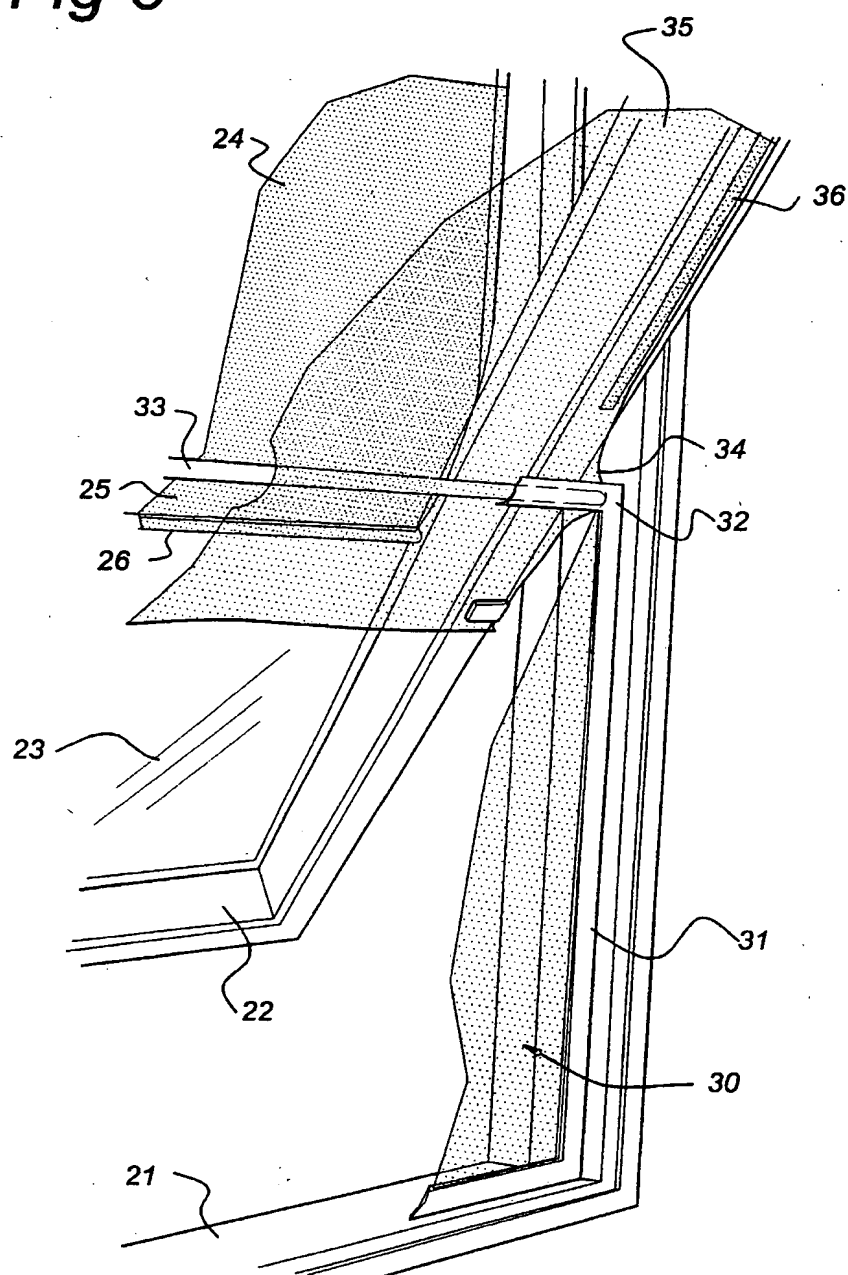
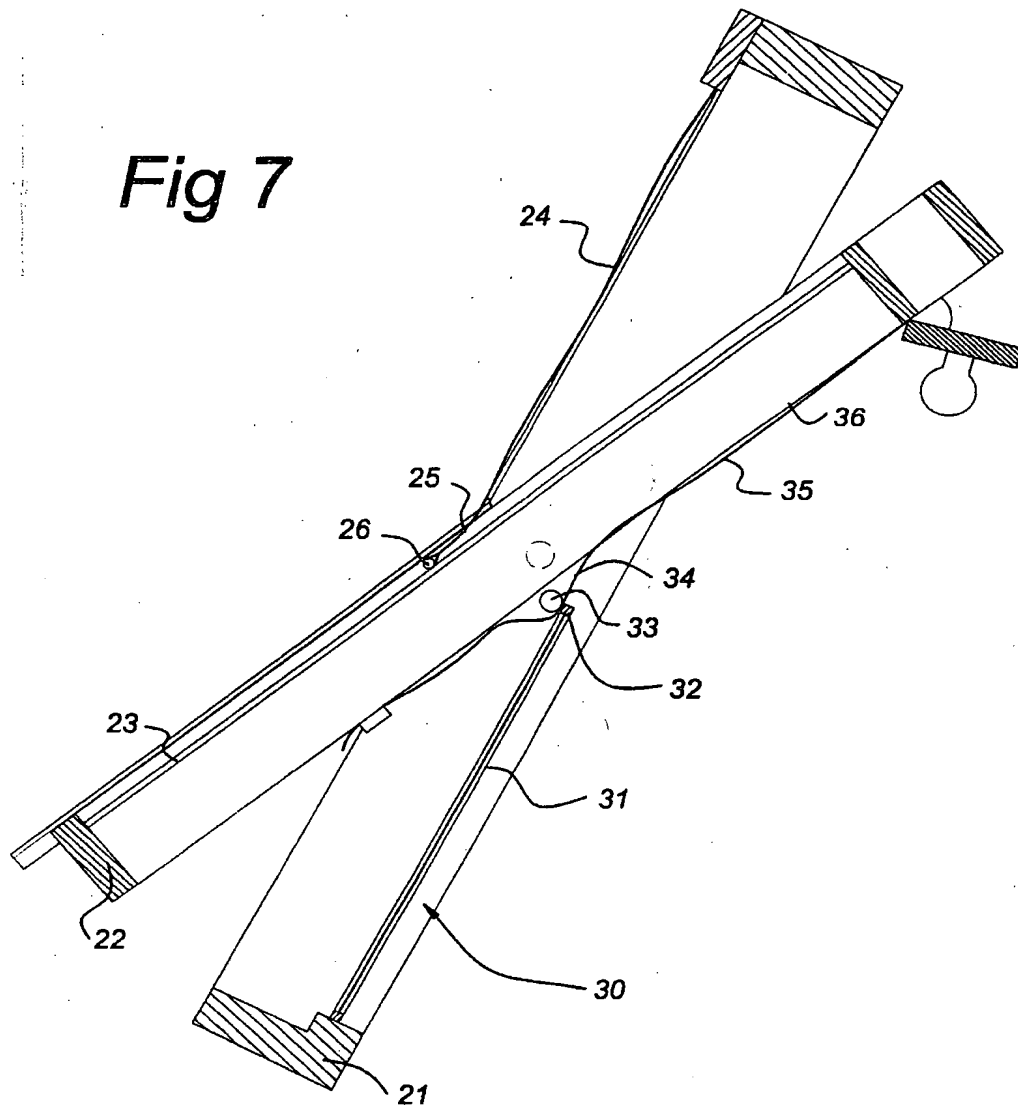


Fig 7

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Fig 8

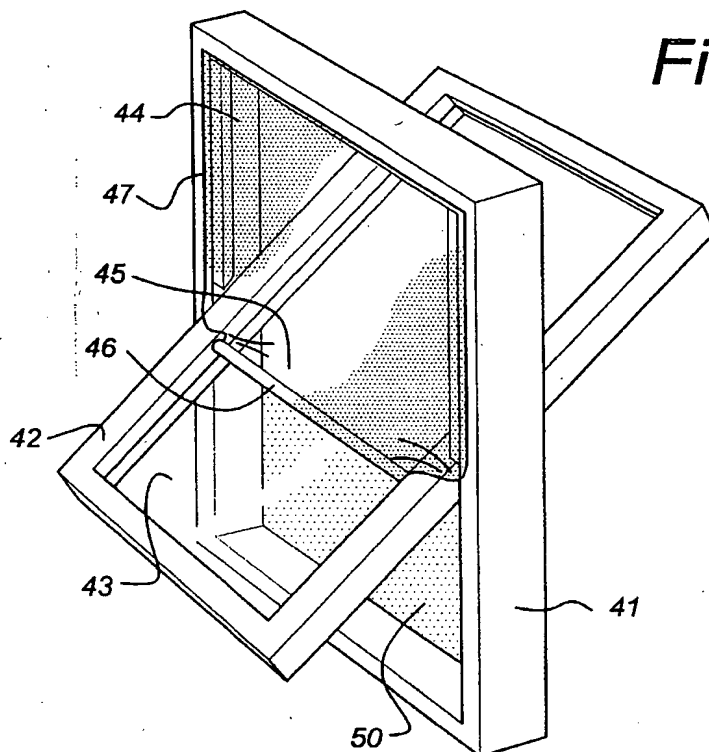


Fig 9

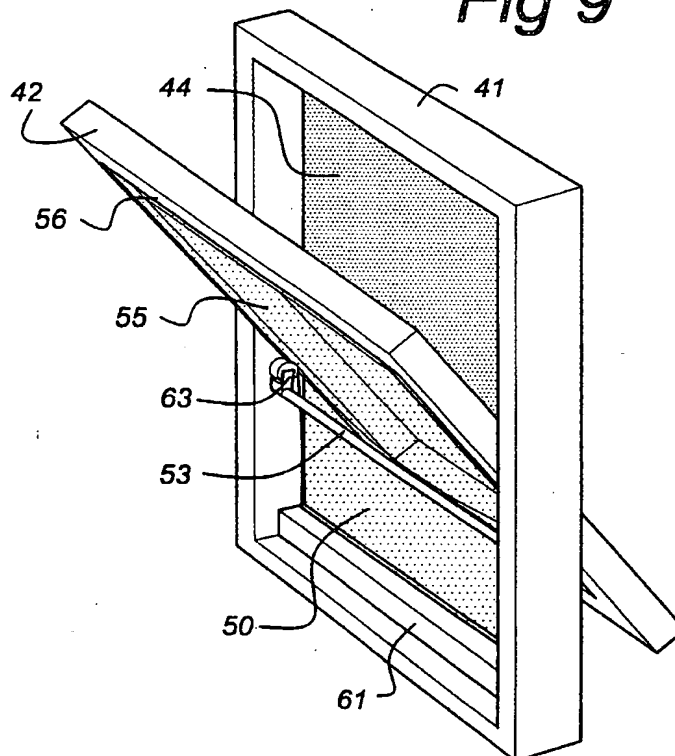
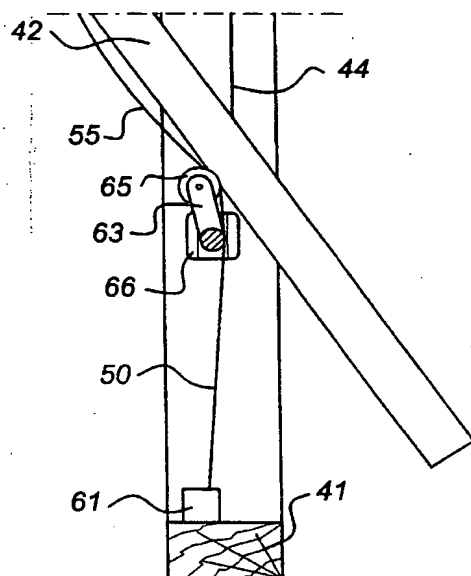
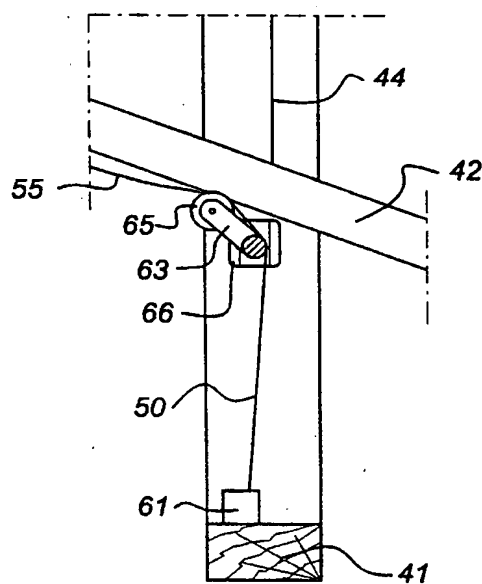
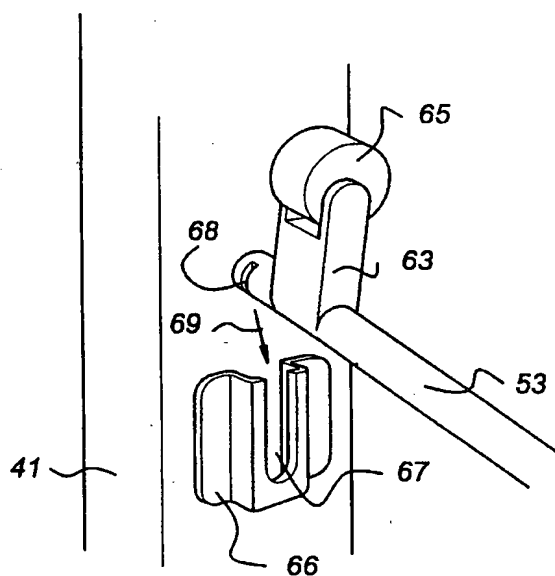


Fig 10*Fig 11**Fig 12*

INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E06B9/52

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1 701 701 A (SODERGREN) 12 February 1929 (1929-02-12) column 2, line 9 - line 30; figure 5	1
A	US 1 778 713 A (BAKER) 21 October 1930 (1930-10-21) page 1, line 44 - line 62; figure 1	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

21 May 2001

Date of mailing of the international search report

29/05/2001

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 1701701	A	12-02-1929	NONE	
US 1778713	A	21-10-1930	NONE	